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**Developing A Watershed Protection Plan
in the Tenmile Creek Drainage,
Lewis and Clark County, Montana**

Report No. 194

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Report No. 194

by

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University of Montana - Forestry

Final Report Submitted to the
MONTANA University System WATER RESOURCES CENTER
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Bozeman, Montana

1996

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A SUMMARY REPORT

**INTEGRATING SOCIAL ASSESSMENT AND BIOPHYSICAL
CHARACTERIZATION FOR WATERSHED PROTECTION
OF UPPER TENMILE CREEK NEAR HELENA, MONTANA**

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INTEGRATING SOCIAL ASSESSMENT AND BIOPHYSICAL CHARACTERIZATION FOR WATERSHED PROTECTION OF UPPER TENMILE CREEK NEAR HELENA , MONTANA

THE WATERSHED PROTECTION APPROACH

Watershed protection is a practical approach to maintaining the quality and supply of surface and groundwater resources within a geographic boundary. The concept has been described by the Environmental Protection Agency "a cooperative, geographically targeted effort to manage, protect and restore environmental and ecological resources in a given watershed". It is generally agreed upon that the best approach to watershed protection is through dialogue and the collaborative, coordinated efforts of individuals, communities, business and government agencies at all levels.

At the heart of the watershed protection approach are three principle concepts. First, identify and evaluate the factors influencing the existing biophysical condition of the watershed. Second, identify and coordinate the key interests in the basin, those people or groups holding diverse views who have a "stake" in the basin. And lastly, develop and implement watershed planning to enhance, protect and sustain water resources.

Water resource issues and problems have traditionally been viewed as scientifically based. Solutions have focused on technical fixes, most often managed by natural resource management agencies. Scientific study of watershed problems is necessary to quantify the existing situation, but we are learning that water resource problems are indeed *social* issues with solutions needing to come from the people who live and work within the watershed in which the problems exist. More often, solutions to a large variety of water resource related problems are being crafted by communities, individuals, and landowners working together with agencies to find common ground.

Historic water rights, multiple and competing land uses, current economic conditions and local political forces are often the predominant controlling factors behind many water related conflicts. Undoubtedly, people in rural and urban settings will identify their concerns within a watershed differently. It is important that participants working within the watershed approach framework understand and respect each other's diverse viewpoints in order to be successful. The people who live and work within the basin stand to have the greatest impact on the land as they are the local land managers. Agencies must sincerely work to be inclusive of the views of residents of the basin as their actions can affect the stream conditions of those people living nearby, as well as those living downstream and future generations.

BACKGROUND ON THE UPPER TENMILE CREEK WATERSHED

The watershed protection approach described above has guided the research efforts of the upper Tenmile Creek watershed project. This report summarizes work completed under the Water Resources Grant program through the Montana Water Center. Research completed in 1995-96 focused on the integration of scientific watershed characterization, social-cultural assessment and effective outreach and educational efforts to forward community dialogue on complex watershed management issues amongst diverse interests near Helena, Montana.

A characterization of the biophysical and social-cultural components of the upper Tenmile Creek watershed was completed in 1996 at the request of the Lewis and Clark County Water Quality Protection District. The project goals were two-fold: to evaluate existing natural resource data in order to determine threats to water quality and supply; and, to conduct an opinion survey of watershed residents to identify perceived problems and to better understand people's concerns regarding watershed use and management. The studies were undertaken with hopes of using the information to further watershed protection and planning efforts in the upper Tenmile watershed using a community-based planning process.

Located approximately 12 miles west of the city of Helena, the upper Tenmile watershed lies just east of the continental divide at the base of McDonald Pass. The basin is mountainous and forested, and roughly 42 square miles (26,000 acres) in size. The Helena National Forest manages 80% as public lands, 20% is privately owned. Much of the private lands were obtained early in this century by individuals who filed and patented mining claims, many of which lie adjacent to Tenmile Creek and its tributaries. Private land today hosts multiple uses, including residential home development, timber harvest, and recreational uses.

The capital city of Helena, Montana receives roughly 70% of its annual drinking water supply from the headwaters streams of the upper Tenmile Creek watershed. The city operates a water collection system made-up of a series of two reservoirs, an aqueduct, and seven stream channels. Intake structures located on three tributaries and the mainstem of Tenmile Creek divert and withdraw water from stream channels on a year-round basis. Water is diverted from the mouths of Moose, Minnehaha, Beaver Creeks, and from the intake on Tenmile Creek in the town of Rimini. Diverted water is conveyed several miles to the Tenmile Water Treatment Plant in the lower basin through an underground concrete pipe. Stream water is treated at the plant to meet the conditions set-forth by the Safe Drinking Water Act before being delivered to town for consumption by Helena's residents. The most senior water rights on Tenmile Creek are held by the city of Helena and date back to 1868, ensuring a reliable supply of drinking water for the city.

COMMUNITY INVOLVEMENT

It is critical that *all* stakeholders be invited to participate in watershed protection efforts in order to gain a representative understanding of watershed management, use and problems, and ultimately for the protection of the basin's land and water resources. To this end, an opinion survey was developed to interview resident households in the upper Tenmile basin using a questionnaire developed for this study. Seventeen of nineteen year-round households participated in responding to the opinion survey. Residents of the basin were very cooperative and eager to talk about their views. The survey provided the watershed's residents with the opportunity to participate and have their views heard.

The opinion survey consisted of ten questions designed to collect specific data and to generate conversation regarding people's concerns and views about current watershed management practices. Introductory letters were mailed to "resident" one week prior to calling on people at their homes. The letter introduced the study and stated that a team of two people would be contacting residents at their homes during a two week period to conduct an opinion survey. The letter described the objective of the study: to better understand watershed uses, people's concerns and perceived problems from the resident's perspective. In return, residents would enable local leaders to better understand the upper Tenmile Creek watershed.

Interviews were completed by the researcher to minimize inconsistency in questioning and discussion format. Responses were recorded in the order discussed, as the first response is often the most significant to the person speaking. Responses from both members in married households were recorded when responses differed. The first questions were designed to be friendly, and to have uncomplicated answers: "where does your drinking water come from", "how do you use your land here", "what are your current water uses besides drinking", and "what kinds of thing and activities do you and your family do in the area". Once a simple dialogue was developed, more personal questions were asked: "are you comfortable with the current way other people are able to use the area? why or why not?". The question which raised the greatest response, "do you have any concerns about your water? either the drinking water source you mentioned above, or other?" revealed the most about people's concerns. The closing questions were again designed to be relatively easy to answer: "has your water been chemically tested", do you have a septic tank, if yes, do you know when it was installed". The final question encouraged involvement: "is there a role you see for other people to help with all these concerns, if yes, who and how".

The results for the questions were tabulated and summarized using percentages. Quotes from residents were included in the report to help make the interview responses come alive. The survey was not designed to stand up to statistical analysis, rather, to get people talking about watershed issues and to listen to, and document what they said. A portion of the results from the question "do you have any concerns about your water?" are included in the table below as an example of the methods used to summarize results and to show the general nature of resident concerns.

**RESIDENT CONCERNS ABOUT WATER RESOURCES
IN THE UPPER TENMILE WATERSHED**

RESIDENT CONCERN (n=17)	FIRST RESPONSE No. (%)	SECOND RESPONSE No. (%)	THIRD RESPONSE No. (%)	TOTAL No. (%) HOUSEHOLDS RESPONDING
Stream Dewatering and Ecology	5 (29%)	3 (18%)	5 (29%)	13 (76%)
Drinking Water Supply	3 (18%)	7 (41%)		10 (59%)
Pollution from Mines	5 (29%)	1 (6%)		6 (35%)
Septic systems	2 (12%)	1 (6%)	2 (12%)	5 (29%)
Fire Hazard	1 (6%)	1 (6%)	1 (6%)	3 (18%)
Timber Harvest			2 (12%)	2 (12%)
Rimini Road		1 (6%)	1 (6%)	2 (12%)
Water rights			1 (6%)	1 (6%)
No response	1 (6%)	3 (18%)	5 (29%)	
TOTAL HOUSEHOLDS	17	17	17	--

Drinking Water Supply

Ten households (59%) responded that having a good quality drinking water source was of great importance to them. "I'd like to see a drinking water supply for Rimini". "They [the government] talked about a treatment plant for Rimini, where they would pay for the first two years and then we would take it over after that". "The government held town meetings, said they'd do something [to supply good water to Rimini]. It fell through. Now they've allowed three new septic tanks upstream". "I wonder if the city is segregating us [town of Rimini] by not providing a safe water source. They take all the water and don't leave us any."

Information collected from the opinion survey showed public concern lies primarily with the use and management of the basin from outside interests, including individuals and government agencies. The outside interests are perceived to have some degree of authority over the residents, since management decisions are made without local involvement. The residents interviewed for the opinion survey were truly interested in watershed issues, but had no forum to discuss their concerns with the agencies making decisions about land and water resource use and management.

The key interests in a watershed often hold diverse points-of-view on land management practices. Ultimately, when private landowners and public land management agencies collectively manage resources, its imperative they work together for the long-term protection of the ecosystem. As described by the Montana Consensus Council, "Individuals and groups are realizing that the best hope to sustain the quality of our land, water, and lifestyles, while providing jobs and economic development is to create forums that include all points of view and seek consensus based solutions."

WATERSHED CHARACTERIZATION

A watershed characterization was completed using existing data and standard methods to evaluate erosion potential, mass wasting, and stream channel stability within the upper Tenmile Creek watershed. These particular basin features were selected for assessment due to problems associated with sedimentation in Tenmile Creek and its tributaries. High sediment loads have been described as the greatest problem faced by operators at the Tenmile Water Treatment Plant. Sediment and high turbidity in water entering the treatment plant increases abrasion of the equipment used in to remove particulate matter. Identifying areas prone to erosion could assist land managers in making decisions to reduce sedimentation and turbidity.

Mass Wasting Assessment

Mass wasting is a natural watershed process by which earthen materials, including soil, overburden or bedrock are moved down slope due to the direct influence of gravity. Depositional materials from landslides may accumulate on floodplains and alluvial terraces, and may or may not enter the stream. Human activities such as mining and logging are known to aggravate erosion and mass wasting processes, creating site-specific cumulative impacts. A mass wasting assessment was completed to identify the causes of depositional features having negative impacts on water resources.

Aerial photographs obtained from the Helena National Forest were used to locate existing mass wasting features and their causes. Pairs of photographs were analyzed in the office using stereo glasses and mass wasting features were mapped on 1:24,000 scale topographic maps. Field verification of mapped locations was completed for landslide features identified from the photographs. A watershed base map showing the locations of mass wasting features and a summary table describing pertinent information about each feature were developed to show the results of the assessment. The summary table described landslide process and type, terrain and associated lithology, whether or not sediment was delivered to the stream and any land use activity associated with the mass wasting feature.

Landslides in the upper Tenmile basin are the result of both natural processes and human activity. Talus is the dominant naturally occurring landslide. All other landslides in the basin are the result of human activity primarily from disturbances which removed vegetative cover, thus exposing soil and rock. Landslides, eroded gullies, debris avalanches and streambank failure were caused from hardrock mining, logging and road construction.

Surface Erosion Assessment

The problems of erosion and sedimentation are critical to streams in many of Montana's watersheds. Erosion is the process of dislodgement and transport of soil particles from land surface by water and wind. Sediment entering streams from all types of terrain can cause problems, including loss of fish spawning and rearing areas, increased water treatment costs, and flooding due to reduced channel capacity. Operators at the Tenmile Water Treatment Plant must often make

adjustments in the water intake system, especially during spring runoff when sediment loads and water turbidity are high.

The purpose of assessing surface erosion potential was to determine a qualitative rating for various landtype units within the basin. Surface erosion potential for the different landscapes was determined based on three basic assumptions. First, the rate of erosion varies with the ease of detachment, some soils require considerable disturbance, while particles from other soils are readily detached and displaced. Second, slope gradient affects how easily materials are eroded and transported, a steep slope is more likely to erode than the same soil on a gentle slope. And third, the proximity of a stream to eroded material can be determined as a delivery efficiency.

In the upper Tennile basin, terrain stability appears to be defined primarily by landform type, parent material/geology, and slope gradient. Taking these characteristics into consideration, two factors were used to characterize surface erosion potential: Sediment Potential Index (SPI), which is derived from values assigned to slope gradient and a geologic erosion factor; and Sediment Delivery Efficiency (SDE), which combines slope gradient with proximity to stream channels. A matrix was developed to employ these factors in order to assign a surface erosion potential rating to landtype aggregates in the basin.

The product of the analysis was a watershed map depicting the qualitative rating for landtype aggregate units, providing a user-friendly tool by which to evaluate erosion potential in the watershed. To summarize, 38% of the basin had a surface erosion potential with a “low” rating. Landforms in this category included basaltic and metasedimentary rock slopes, mountain ridges, and some tills and moraines. Landforms with a “moderate” rating included 37% of the basin, and consisted of colluvial deposits, granitic slopes, and friable loamy tills and moraines. Twenty-five percent of the basin had a “high” surface erosion potential primarily in granitic landforms and alluvial floodplains and terraces.

Stream Channel Stability Assessment

The Helena National Forest and U.S. Geological Survey were contacted for information regarding existing information on stream channel morphology, streamflow measurement, and water quality data. Streamflow record was obtained for the U.S. Geological Survey gaging station, Tennile near Moose Creek. The station has a period of record of roughly 80 years. Water quality information available from the Helena National Forest was collected intermittently at one monitoring location on Tennile Creek near the Banner Creek confluence monthly from April to October from 1981 to 1989. Water quality parameters analyzed included stream discharge, suspended sediment, suspended load, turbidity, pH, specific conductance, temperature and total alkalinity and total hardness.

In 1995, no evaluations of stream channel condition had been performed. Therefore, the assessment for this study focused on data collection to evaluate existing stream channel conditions using established methods. Evaluations were completed to determine existing conditions of selected stream reaches on different geologic substrates, and to compare methods employed by the State of Idaho versus the State of Montana.

Field forms used by environmental departments in Montana and Idaho to were completed according to the described methodology for each state. Field forms used similar criteria to evaluate channel stability, including presence and condition of streamside vegetation, bank stability, substrate composition and particle size distribution, channel stability, presence of in-stream organic debris, and a visual appraisal of water quality. A numerical score was assigned to each of the criteria based on the condition of the resource. Criteria values were weighted depending on their relative importance and perceived influence on stream condition according to the methodology. The total of the weighted scores produced a "stream rating" for each evaluated stream reach.

Stream channels were evaluated at ten locations within the study area, on tributaries and the mainstem of Tenmile Creek. This technique provides for the evaluation of stream conditions during one "spa-shot" in time. Long-term, repeated stream channel evaluation is needed to more fully depict the full range of dynamic conditions influencing stream channels. The resultant scores from each field form were tabulated for the assessed locations. A strong correlation existed between the Idaho and Montana ratings at most stations.

GEOGRAPHIC INFORMATION SYSTEM

The natural resource characteristics of the upper Tenmile watershed have been extensively mapped by the Helena National Forest. The information is stored electronically using a Geographic Information System (GIS) and ArcInfo software. The private consultancy, Watershed Research Associates (WRA) of Helena was contracted to assist in obtaining and using pertinent information available through the GIS for the watershed characterization. WRA exported specified data coverages from the Montana Natural Resource Information System databases to complete mapping and analysis of watershed conditions. A series of project maps was generated from the study area:

- * Upper Tenmile Creek watershed study area
- * Streams, diversions and intakes
- * Geology and landform aggregates
- * Landtype associations (vegetation groups)
- * Land ownership
- * Mine locations
- * Mass wasting features
- * Erosion potential ratings
- * Wells and septic systems

OUTREACH AND EDUCATION

A series of community meetings was held following the completion of the watershed characterization. The goal of the meetings was to raise awareness about the Tenmile watershed. Specifically, of potential threats to water quality and supply and to generate interest amongst the various stakeholder groups to become involved in watershed planning. Numerous presentations of the results of the watershed characterization and opinion survey were given to a wide range of audiences, including the Montana Department of Natural Resources Water Resource Division staff, Montana Watershed Coordination Council, City of Helena Commission and staff, Lewis and Clark County Commission and staff, and County Water Quality Protection District Board.

The most significant presentation was given to the watershed residents who had participated in the opinion survey along with all the agency representatives which had provided information for the watershed characterization. Approximately 60 people gathered in the town of Rimini in the watershed to listen to the results of the studies. Following the presentation, the audience was asked if they would like to continue meeting to begin discussions on finding solutions to watershed problems. Overwhelmingly, people decided to continue to meet and the Upper Tenmile Watershed Steering Group was formed in March, 1996.

INTEGRATING SOCIAL ASSESSMENT AND BIOPHYSICAL CHARACTERIZATION FOR WATERSHED PROTECTION OF UPPER TENMILE CREEK NEAR HELENA , MONTANA

~Addendum to Summary Report~

Presentations(add to existing list)

- Montana American Water Resources Association student presentation to state-wide conference; second place award presented for “best student talk”. (October, 1996)
- Helena Area Science Circus, community event at the local high school highlighting science projects (March 1997&1998)
- Lewis and Clark Conservation District (April 1997)
- Natural Resources Conservation Services(NRCS) team leader training workshop on watershed partnerships, technical and social aspects(October, 1997).
- State conference for Environmental Protection Agency on source water and watershed protection (September, 1997)
- Upper Tennmile Watershed Steering Group presentation of analytical water quality results (November 1998)
- Montana Watershed practitioners working group (November, 1998)
- Flathead County Water District Task Force, comprised of County Commission, City staff and commission for Whitefish, Kalispell, and Columbia Falls, citizens, Board of Health members interested in watershed protection for Whitefish Lake. (September, 1998 and 1999)
- Leadership Helena, a local civic group of concerned citizens educating themselves about local issues invited the presentation as their environment day! (April, 1999)

Formation of the Upper Watershed Steering Group

- The Upper Tennmile Watershed Steering Group formed in March 1997, following the initial watershed characterization completed from the EPA grant.
- The group has met roughly 36 times as of March 1999: The group meets monthly.
- The technical subcommittee of the watershed group meets on a ad hoc basis when technical issues require additional consideration
- Ground rules were adopted in February 1997 to guide monthly meetings, the group’s organization and decision making processes
- Thirteen caucuses were formed as the primary membership of the watershed group.

Significant and Notable Accomplishments

The following list summarizes the activities that have taken place under the direction, guidance and decision-making policies of the upper Tenmile Watershed Steering Group

Hydrologic Characterization (Streamflow)

One component of the water resources baseline investigation was completed by the U.S. Geological Survey(USGS), Lewis and Clark County Water Quality Protection District (WQPD), and residents of the watershed to collect baseline streamflow information. The purpose of the study was to collect data to estimate long-term monthly mean flows, and determine flow characteristics (gains and losses) along the mainstem of Tenmile Creek from the intake in Rimini to the water treatment plant. A stream gaging system of 39 monitoring locations was established by the USGS with support of watershed group members for the purpose of the hydrologic characterization studies. The project has been supported by the residents of Rimini, Lewis and Clark County, State of Montana, USGS, and the Environmental Protection Agency. (1997-99)

Hydrologic Characterization (Water quality)

A second component of the water resources baseline investigation characterized existing water quality in Tenmile Creek and the major tributaries in the upper Tenmile Creek basin. Water quality samples were collected from 21 stations during the study. Samples were collected during May, June, August and October to determine seasonal changes in water quality. Chemical data from water quality samples was used to determine exceedences to water quality standards and to calculate chemical loads to assist in the development of the total maximum daily load (TMDL).(1997-99)

USGS Sodium Chloride Tracer Study

In 1998, the USGS conducted a “tracer study” on Tenmile Creek using measured concentrations of sodium chloride solution to determine groundwater-surface water interactions. Water quality samples were collected from springs, tributaries and other sources potentially contributing discrete amounts of trace metals to Tenmile Creek. The EPA and USGS funded the project with field assistance from numerous interested parties. As follow-up to this study, the DNRC and WQPD used a Global Positioning System(GPS) to record the water quality sampling points and other stream features identified by USGS. The GPS data adds information to the Geographic Information System (GIS) database already in existence for the upper Tenmile watershed. (1998-99)

MT Department of Fish, Wildlife and Parks Fisheries Study

The Montana Department of Fish, Wildlife and Parks is in the second year of a three year study to determine the distribution, health and diversity of fish populations in Tenmile Creek and its headwaters tributaries. Fish “shocking” was completed in 1998 to estimate numbers and species composition. Macroinvertebrate insect samples were also collected to better understand the food supply available to fish. Fish tissue are being analyzed for trace elements to determine

levels of uptake, and how metals are metabolically affecting fish. (1997-99)

Stream Channel Physical Features Inventory

The Natural Resources Conservation Service (NRCS) and MT Department of Fish, Wildlife and Parks is in the process of conducting a physical features inventory of the mainstem of Tennile Creek from the Helena water treatment plant to Rimini. The primary focus of the inventory was to identify areas acting as sources for sediment, such as the interface between the Rimini road and Tennile Creek. The inventory also evaluated the current status of fish habitat, including pool:rifle ratios, suitability of gravels for fish redds, and general habitat features. This study is ongoing and will continue into 1999. (fall 1998 and spring 1999)

Watershed Tour

The Upper Tennile Watershed Steering Group hosted its second annual watershed tour for more than 50 fifth-graders from the Four Georgians Elementary School in Helena. The main features of the tour included interactive stations throughout the basin that investigated streamflow measurement, reclamation of the Red Water mine site, local history, groundwater movement, aquatic insects, and Helena's water supply. Everyone enjoyed the day! (October 1998 and 1999)

Streambank Stabilization Projects

In spring, 1998, volunteers from the Helena area, members of the Tennile watershed group, and the Montana Youth Conservation Corps helped plant approximately 1700 shrubs and trees along the banks of Tennile Creek. Plains cottonwood, Douglas-fir, Wood's rose, and red-osier dogwood were planted to help stabilize eroding streambanks and improve fish habitat. Flooding and uncontrolled grazing by livestock have left some streambanks bare and vulnerable to erosion causing non-point source pollution by sediment. A second planting project is scheduled for spring, 1999. (June, 1998, proposed for June 1999)

USFS Mine Waste Removals

The US Forest Service is planning mine reclamation of three inactive hardrock mines in the headwaters of the Minnehaha drainage beginning in 1999. Minnehaha Creek is a tributary of Tennile Creek and a major perennial stream which supplies water to the City of Helena. Plans are being developed to stabilize and/or remove mine waste from the Armstrong, Beatrice, and Justice mines. (Proposed for 1999)

EPA Mine Waste Removal Actions

The EPA's Removal Program team is developing plans for the removal of mine wastes at the Red Mountain Mine and Tennile/Bunker Hill mine beginning in 1999. Poison Creek which flows through mine waste at the Red Mountain Mine contributes high concentrations of lead, cadmium, and arsenic to Tennile Creek. Landslides emanating from the Bunker Hill mine continue to deposit metalliferous laden sediment on the Tennile Creek floodplain just upstream from the City's main water intake on Tennile Creek. Efforts are underway to arrange for

transported mine waste to be stored at the nearby Luttrell Pit (Proposed for 1999)

EPA CERCLA Mine Waste Remediation

In 1998, the EPA began the process of evaluating the upper Tenmile watershed for placement of certain mine sites on the National Priorities List. The Hazard Ranking System is used to evaluate specific criteria in the basin and ranks the site with a numeric score. If the score is sufficient and the site prioritized by the EPA, the Tenmile basin could become eligible to receive Superfund Program funding. Superfund would provide a comprehensive, basin-wide cleanup of mine wastes, and potentially address the problems of acid mine drainage and a safe drinking water supply for Rimini. (Proposed for 1999)

Luttrell Pit Repository Assessment

The EPA has recommended the Luttrell Pit be considered for a mine-waste repository to facilitate the cleanup of inactive mines in the Tenmile and Basin Creek watersheds. The Luttrell Pit concept originated in 1995 with the US Forest Service, but met with opposition and was tabled until 1998. A rigorous analysis of the pit area's geology, depth to groundwater, and seismic potential is being conducted by the USGS for the EPA (1999)

AIMSS Project Ranking System

The Montana Department of Environmental Quality (DEQ) AIMSS List prioritizes Montana's inactive mine sites for Remediation. The 1998 list places eight mines located within the upper Tenmile watershed, within the top forty entries. (1995-98)

Redwater Mine Remediation

In 1996, the EPA's Removal Program stabilized mine waste at the Red Water Mine site. The site is located just one-quarter mile upstream of the City's main water intake on Tenmile Creek. (1996)

DEQ Sample Adit Discharge Study

In 1996, the MT DEQ sampled mine adit discharges at Red Mountain and in the vicinity of Rimini to assess water quality. Chemical results will be used to develop the trace metals portion of the basin's TMDL. (1996)

DEQ Road Material Sampling Study

In 1997, the DEQ responded to a citizen complaint about road dust in the town of Rimini. The DEQ sampled roadbed material to determine whether elevated concentrations of trace metals were present in materials used to repair roads following the flood in 1981. (1997)

Water Rights Mediation

The Montana Water Court has been in the process of water rights adjudication for

Tennmile Creek for the past two years. Objections existed over water rights held by the City of Helena and the Town of Rimini over access to water originating in upper Tennmile basin for their independent municipal water supplies. Mediation occurred outside the watershed Steering Group's activities as a private matter. A settlement reached in 1998 allows Rimini residents to use untreated water from City's Chessman and Scott reservoirs for household use without recognition of any water right (1998)

Lee Mountain Waste Remediation

In 1991, the MT DEQ Abandoned Mine Reclamation Bureau stabilized the Lee Mountain Mine site. The mine is located south of Rimini on the west bank of Tennmile Creek. (1991)

Additional funding opportunities during the grant period

During the past five years, the following grant funds have been allocated toward work on Upper Tennmile Creek.

Source	Date	Amount
Lewis and Clark County	1995-96	\$5000
MT Dept. Of Environmental Quality 104(b)(3); 100% match from US Geological Survey	1997-99	\$67,500
MT Dept of Fish, Wildlife and Parks (fisheries study)	1997-1999	??
MT Dept of Environmental Quality (non-point source program: periphyton/macroinvertebrate study)	1997	\$10,000
MT Dept of Environmental Quality (non-point source program: water quality monitoring)	1999	in review process
MT Dept of Fish, Wildlife and Parks (Future Fisheries program)	1999	~\$5000
Numerous hours of donated services by watershed residents, property owners and citizens, business interests, teachers, students, boy scouts... and natural resource professionals, including: US Geological Survey, Natural Resources Conservation Service, Helena National Forest, Environmental Protection Agency, MT Departments of Natural Resources and Conservation, Environmental Quality, and Fish, Wildlife and Parks, City of Helena, Lewis and Clark County, et cetera		

